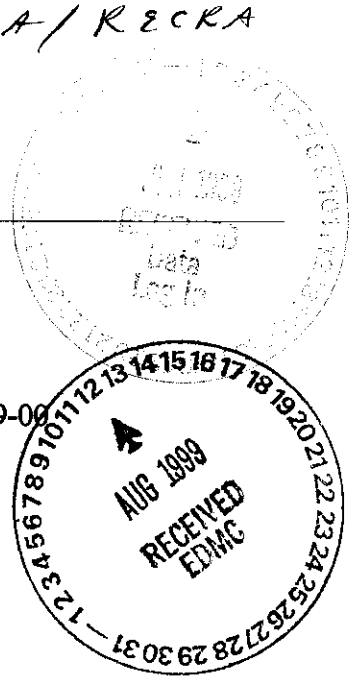
H0394-TMA/RECRA

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0051533



Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-001
RFW# : 9904L833
SDG/SAF# : H0394/B99-001

W.O.# : 10985-001-001-9999-00
Date Received: 04-30-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at the following concentration level:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0V843	Chromium	500	98.4

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-13-99
Date

mld/m04-833

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9904L833

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B	__200.7			__99
Antimony	__6010B __7041 [5]	__200.7 __204.2			__99
Arsenic	__6010B __7060A [5]	__200.7 __206.2	__3113B		__99
Barium	__6010B	__200.7			__99
Beryllium	__6010B	__200.7			__99
Bismuth	__6010B [1]	__200.7 [1]		__1620	__99
Boron	__6010B	__200.7			__99
Cadmium	__6010B __7131A [5]	__200.7 __213.2			__99
Calcium	__6010B	__200.7			__99
Chromium	✓6010B __7191 [5]	__200.7 __218.2			__SS17
Cobalt	__6010B	__200.7			__99
Copper	__6010B __7211 [5]	__200.7 __220.2			__99
Iron	__6010B	__200.7			__99
Lead	✓6010B __7421 [5]	__200.7 __239.2	__3113B		__99
Lithium	__6010B __7430 [4]	__200.7		__1620	__99
Magnesium	__6010B	__200.7			__99
Manganese	__6010B	__200.7			__99
Mercury	__7470A [3] ✓7471A [3]	__245.1 [2] __245.5 [2]			__99
Molybdenum	__6010B	__200.7			__99
Nickel	__6010B	__200.7			__99
Potassium	__6010B __7610 [4]	__200.7 __258.1 [4]			__99
Rare Earths	__6010B [1]	__200.7 [1]		__1620	__99
Selenium	__6010B __7740 [5]	__200.7 __270.2	__3113B		__99
Silicon	__6010B [1]	__200.7		__1620	__99
Silica	__6010B	__200.7		__1620	__99
Silver	__6010B __7761 [5]	__200.7 __272.2			__99
Sodium	__6010B __7770 [4]	__200.7 __273.1 [4]			__99
Strontium	__6010B	__200.7			__99
Thallium	__6010B __7841 [5]	__200.7 __279.2 __200.9			__99
Tin	__6010B	__200.7			__99
Titanium	__6010B	__200.7			__99
Uranium	__6010B [1]	__200.7 [1]		__1620	__99
Vanadium	__6010B	__200.7			__99
Zinc	__6010B	__200.7			__99
Zirconium	__6010B [1]	__200.7 [1]		__1620	__99

Other:_____ **Method:**_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V843	Chromium, Total	53.9	MG/KG	0.46	1.0
		Mercury, Total	0.22	MG/KG	0.02	1.0
		Lead, Total	8.9	MG/KG	3.5	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0265-MB1	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Lead, Total	3.3 u	MG/KG	3.3	1.0
BLANK1	99C0122-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0V843	Chromium, Total	66.1	53.9	19.6	62.2	1.0
		Mercury, Total	0.37	0.22	0.18	81.7	1.0
		Lead, Total	46.3	8.9	48.9	76.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0V843	Chromium, Total	53.9	46.2	15.4	1.0
		Mercury, Total	0.22	0.19	15.5	1.0
		Lead, Total	8.9	10.2	13.6	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0265-LC1	Chromium, LCS	46.2	50.0	MG/KG	92.4
		Lead, LCS	226	250	MG/KG	90.5
LCS1	99C0122-LC1	Mercury, LCS	1.0	1.0	MG/KG	103.3

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-001

DATE RECEIVED: 04/30/99 RFW LOT # :9904L833

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V843						
CHROMIUM, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	001	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 REP	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 MS	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
LAB QC:						
CHROMIUM LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
CHROMIUM, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99
MERCURY LABORATORY	LC1 BS	S	99C0122	N/A	05/04/99	05/05/99
MERCURY, TOTAL	MB1	S	99C0122	N/A	05/04/99	05/05/99
LEAD LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
LEAD, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99

RECRA LabNet Use Only
99041833

RECRA LabNet

Custody Transfer Record/Lab Work Request

Client: TNU-Hanford B99-001
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: Spoo Del: Spoo TAT: 7 day
Date Rec'd: 4/30/99 Date Due: 5/7/99
Account #:

Refrigerator #		3	3
#/Type Container	Liquid		
	Solid	1	1 oz
Volume	Liquid		
	Solid	1	125
Preservatives			—

ANALYSES REQUESTED →

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				ICP6	Metal: Cr Pb Hg	CN							
001	B0V843	X	X	S	4/27/99	1300								X	X								

(ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; RECRA LabNet Use Only)

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special instructions:

COMPOSITE WASTE

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	[signature]	4/30/99	0900				

ORIGINAL REWRITTEN

Discrepancies Between Samples Lables and COC Record? Y or (N)
NOTES:
4235795253711

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N

4.3°

011

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-001-156	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Fahlberg/Kerkow	R Coffman 373-6425	TRENT, SJ	7 days
Project Designation	**Sampling Location**	**SAF No.**	
100 BC Areas - Quick Turn	100 B/C 116-C-2	B99-001	
Ice Chest No.	**Field Logbook No.**	**Method of Shipment**	
ERC 99-003012 B 04-27-99	EL 1327-2	Federal Express	
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**	
~~TMA~~/RECRA RE 4-27-99	A990126	B 04-29-99 4235 7952 5371	
		COA M: R16C2A 2600	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	P	G	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL	500mL					
SAMPLE ANALYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time									
B0V843	Soil	4-27-99	800		X							

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (SW-846) {Chromium, Lead}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Cesium-134, Uranium-238}; Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	4-27-99 1550	Ref # 1 CHR	4/27/99 1550
Relinquished By	Date/Time	Received By	Date/Time
Ref 1 C	4-29-99 0930	Doug Bowers	4-29-99/0930
Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	4-29-99/1030	Fed Ex	
Relinquished By	Date/Time	Received By	Date/Time
Fed Ex	4/30/99 0900		4/30/99 0900

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

012

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0265-MB1	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Lead, Total	3.3 u	MG/KG	3.3	1.0
BLANK1	99C0122-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0V843	Chromium, Total	66.1	53.9	19.6	62.2	1.0
		Mercury, Total	0.37	0.22	0.18	81.7	1.0
		Lead, Total	46.3	8.9	48.9	76.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0V843	Chromium, Total	53.9	46.2	15.4	1.0
		Mercury, Total	0.22	0.19	15.5	1.0
		Lead, Total	8.9	10.2	13.6	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/11/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0265-LC1	Chromium, LCS	46.2	50.0	MG/KG	92.4
		Lead, LCS	226	250	MG/KG	90.5
LCS1	99C0122-LC1	Mercury, LCS	1.0	1.0	MG/KG	103.3

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-001

DATE RECEIVED: 04/30/99 RFW LOT # :9904L833

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V843						
CHROMIUM, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	001	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 REP	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 MS	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
LAB QC:						
CHROMIUM LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
CHROMIUM, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99
MERCURY LABORATORY	LC1 BS	S	99C0122	N/A	05/04/99	05/05/99
MERCURY, TOTAL	MB1	S	99C0122	N/A	05/04/99	05/05/99
LEAD LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
LEAD, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99

RECRA LabNet Use Only

99041833

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client TNU-Hanford B99-001
Est. Final Proj. Sampling Date
Project # 10985-001-001-9999-00
Project Contact/Phone #
RECRA Project Manager OJ
QC Spoa Del Spoa TAT 7 day
Date Rec'd 4/30/99 Date Due 5/7/99
Account #

Refrigerator #								3	3								
#/Type Container	Liquid																
	Solid							1	1oz								
Volume	Liquid																
	Solid							1	125								
Preservatives									—								
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN							
RECRA LabNet Use Only								ICP6	Cr Pb Hg								

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ICP6	Cr Pb Hg
001	B0V843	X	X	S	4/27/99	1300	X	X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	[signature]	4/30/99	0900				

ORIGINAL REWRITTEN

Discrepancies Between Samples Lables and COC Record? Y or (N)
NOTES:
4235795253711

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # *
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N

4.3°

011

Page 1 of 1

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-001-156	Page 1 of 1

Collector Fahlberg/Kerkow	**Company Contact** R Coffman **Telephone No.** 373-6425	**Project Coordinator** TRENT, SJ	**Price Code** **Data Turnaround**
Project Designation 100 BC Areas - Quick Turn	**Sampling Location** 100 B/C 116-C-2	**SAF No.** B99-001	7 days
Ice Chest No. ERC 99-003012 $ 04-29-99	**Field Logbook No.** EL 1327-2	**Method of Shipment** Federal Express	
Shipped To ~~TMA~~/RECRA RE 4-27-99	**Offsite Property No.** A990126	**Bill of Lading/Air Bill No.** $ 04-29-99 4235 7952 5371	
		COA M: R16C2A 2600	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	P	G	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
Special Handling and/or Storage	**Volume**	20mL	60g	60mL	60mL	500mL					
SAMPLE ANALYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time									
B0V843	Soil	4-27-99	1300		X							

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	R. Fahlberg / R. Fahlberg	4-27-99 1550
Received By	Ref # 1 CHR	4/27/99 1550
Relinquished By	Ref 1 C	4-29-99 0930
Received By	Doug Bowers	4-29-99 0930
Relinquished By	Doug Bowers	4-29-99 1030
Received By	Fed Ex	
Relinquished By	Fed Ex	4/30/99 0900
Received By		4/30/99 0900

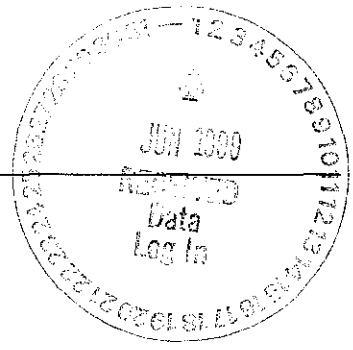
SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (SW-846) {Chromium, Lead}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Cesium-134, Uranium-238}; Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere



Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-001
RFW# : 9904L833
SDG# : H0394
SAF# : B99-001

W.O. # : 10985-001-001-9999-00
Date Received: 04-30-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Sample (LCS) for Soluble Chromium VI was within the laboratory control limits, however LCS for Insoluble Chromium VI was above the 80-120% acceptance limits.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-25-99
Date

njp\i04-833

WET CHEMISTRY
METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	ASTM	SW846	OTHER
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __by coupon __by pH		__ 1110 (mod)__ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87 (mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Chromium VI Method: SW3060A/7196A

002

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/25/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V843	% Solids	89.6	%	0.01	1.0
		Chromium VI	7.2	MG/KG	0.45	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/25/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L033

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI037-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/25/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0V843	Soluble Chromium VI	17.2	7.2	8.9	111.4	2.0
		Insoluble Chromium VI	1340	7.2	1110	120.9	100
BLANK10	99LVI037-MB1	Soluble Chromium VI	3.8	0.40u	4.0	96.0	1.0
		Insoluble Chromium VI	1550	0.40u	1210	128.0	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/25/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9904L833

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0V843	% Solids	89.6	88.7	1.0	1.0
		Chromium VI	7.2	7.2	1.3	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-001

DATE RECEIVED: 04/30/99 RFW LOT # :9904L833

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0V843						
% SOLIDS	001	S	99L%S061	04/27/99	05/03/99	05/04/99
% SOLIDS	001 REP	S	99L%S061	04/27/99	05/03/99	05/04/99
CHROMIUM VI	001	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 REP	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 MS	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 MSD	S	99LVI037	04/27/99	05/03/99	05/03/99
LAB QC:						
CHROMIUM VI	MB1	S	99LVI037	N/A	05/03/99	05/03/99
CHROMIUM VI	MB1 BS	S	99LVI037	N/A	05/03/99	05/03/99
CHROMIUM VI	MB1 BSD	S	99LVI037	N/A	05/03/99	05/03/99

RECRA LabNet Use Only

9904L833

Custody Transfer Record/Lab Work Request

RECRA LabNet

600

Client TNU-Hanford B99-001

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager DJ

QC Spec Del Spec TAT 7 day

Date Rec'd 4/30/99 Date Due 5/7/99

Account #

Refrigerator #									3	3									
#/Type Container	Liquid																		
	Solid								1	1									
Volume	Liquid									0									
	Solid								1	125									
Preservatives										—									
ANALYSES REQUESTED →		ORGANIC								INORG									
		VOA	BNA	Pest/PCB	Herb					Metal	CN								
										RECRA LabNet Use Only									

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	BOV843	X	X	S	4/27/99	1300													

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

COMPOSITE WASTE

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

RECRA LabNet Use Only

Samples were: ✓
1) Shipped ___ or Hand Delivered ___
Airbill # ✱
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Discrepancies Between Samples Lables and COC Record? Y or (N)

NOTES: ✱ 423579525371 Cooler temp = 4.3°C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	4/30/99	0900

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

4.2

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-001-156	Page 1 of 1

010

Collector Fahlberg/Kerkow	**Company Contact** R Coffman **Telephone No.** 373-6425	**Project Coordinator** TRENT, SJ	**Price Code** **Data Turnaround**
Project Designation 100 BC Areas - Quick Turn	**Sampling Location** 100 B/C 116-C-2	**SAF No.** B99-001	7 days
Ice Chest No. ERC 99-~~003~~ 012 RE 4-29-99	**Field Logbook No.** EL 1327-2	**Method of Shipment** Federal Express	
Shipped To ~~TMA~~/RECRA RE 4-27-99	**Offsite Property No.** A990126	**Bill of Lading/Air Bill No.** RE 4-29-99 4235 7952 5371	
		COA RE: A16C2A 2600	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	P	G	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL	500mL					
SAMPLE ANALYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time										
B0V843	Soil	4-27-99	1300		X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	4-27-99 1550	Ref #1 C	4/27/99 1550
Ref 1 C	4-29-99 0930	Doug Bowers / Doug Bowers	4-29-99 / 0930
Doug Bowers / Doug Bowers	4-29-99 / 1030	Fed Ex	
Fed Ex	4/30/99 0900	[signature]	4/30/99 / 0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (SW-846) {Chromium, Lead}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Cesium-134, Uranium-238}; Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0394 is composed of a single solid (soil) sample designated under SAF No. B99-001 with a Project Designation of: 100 BC Areas-Quick Turn.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Data for Gamma Scan, Total Strontium and Isotopic Uranium was faxed to BHI on May 7, 1999; Nickel-63 and Isotopic Plutonium was faxed on May 18, 1999 and Americium data was transmitted by fax on June 4, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the processing of the samples.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

The sample was reanalyzed due to very low recoveries on the initial analysis. No problems were encountered during the reanalysis.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

SAMPLE SUMMARY

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V843	100 B/C 116-C-Z	SOLID		N904162-01	B99-001	B99-001-156	04/27/99 13:00
Method Blank		SOLID		N904162-03	B99-001		
Method Blank		SOLID		N904162-06	B99-001		
Lab Control Sample		SOLID		N904162-02	B99-001		
Lab Control Sample		SOLID		N904162-05	B99-001		
Duplicate (N904162-01)	100 B/C 116-C-Z	SOLID		N904162-04	B99-001		04/27/99 13:00
Duplicate (N904162-01)	100 B/C 116-C-Z	SOLID		N904162-07	B99-001		04/27/99 13:00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

QC SUMMARY

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7718	B99-001-156	B0V843	SOLID	89.8			04/30/99	3	N904162-01	7718-001
		Method Blank	SOLID						N904162-03	7718-003
		Method Blank	SOLID						N904162-06	7718-006
		Lab Control Sample	SOLID						N904162-02	7718-002
		Lab Control Sample	SOLID						N904162-05	7718-005
		Duplicate (N904162-01)	SOLID	89.8			04/30/99	3	N904162-04	7718-004
		Duplicate (N904162-01)	SOLID				04/30/99	3	N904162-07	7718-007

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

PREP BATCH SUMMARY

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	2851-074	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	2851-074	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	2851-074	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	2851-074	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	2851-074	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	2851-074	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

WORK SUMMARY

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
B0V843			N904162-01	7718-001	AM	A1	06/01/99	06/07/99	TAH	Americium 241 in Soil
100 B/C 116-C-Z		SOLID	04/27/99	7718-001	GAM		05/05/99	05/07/99	TAH	Gamma Scan
B99-001-156	B99-001		04/30/99	7718-001	NI_L		05/09/99	05/18/99	TAH	Nickel 63 in Soil
				7718-001	PU		05/10/99	05/18/99	TAH	Plutonium, Isotopic in Solids
				7718-001	SR		05/05/99	05/07/99	TAH	Total Strontium in Soil
				7718-001	U		05/05/99	05/07/99	TAH	Uranium, Isotopic in Soil
Method Blank			N904162-03	7718-003	GAM		05/05/99	05/07/99	TAH	Gamma Scan
		SOLID		7718-003	NI_L		05/09/99	05/18/99	TAH	Nickel 63 in Soil
	B99-001			7718-003	PU		05/10/99	05/18/99	TAH	Plutonium, Isotopic in Solids
				7718-003	SR		05/05/99	05/07/99	TAH	Total Strontium in Soil
				7718-003	U		05/05/99	05/07/99	TAH	Uranium, Isotopic in Soil
Method Blank			N904162-06	7718-006	AM		06/01/99	06/07/99	TAH	Americium 241 in Soil
		SOLID								
	B99-001									
Lab Control Sample			N904162-02	7718-002	GAM		05/05/99	05/07/99	TAH	Gamma Scan
		SOLID		7718-002	NI_L		05/09/99	05/18/99	TAH	Nickel 63 in Soil
	B99-001			7718-002	PU		05/10/99	05/18/99	TAH	Plutonium, Isotopic in Solids
				7718-002	SR		05/05/99	05/07/99	TAH	Total Strontium in Soil
				7718-002	U		05/05/99	05/07/99	TAH	Uranium, Isotopic in Soil
Lab Control Sample			N904162-05	7718-005	AM		06/01/99	06/07/99	TAH	Americium 241 in Soil
		SOLID								
	B99-001									
Duplicate (N904162-01)			N904162-04	7718-004	GAM		05/05/99	05/07/99	TAH	Gamma Scan
100 B/C 116-C-Z		SOLID	04/27/99	7718-004	NI_L		05/09/99	05/18/99	TAH	Nickel 63 in Soil
	B99-001		04/30/99	7718-004	PU		05/10/99	05/18/99	TAH	Plutonium, Isotopic in Solids
				7718-004	SR		05/05/99	05/07/99	TAH	Total Strontium in Soil
				7718-004	U		05/05/99	05/07/99	TAH	Uranium, Isotopic in Soil
Duplicate (N904162-01)			N904162-07	7718-007	AM		06/01/99	06/07/99	TAH	Americium 241 in Soil
100 B/C 116-C-Z		SOLID	04/27/99							
	B99-001		04/30/99							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-001	Americium 241 in Soil	AM/CMPLATE	1			1	1	1	4
GAM	B99-001	Gamma Scan	GAMMAHI	1			1	1	1	4
NI_L	B99-001	Nickel 63 in Soil	NI63LSC	1			1	1	1	4
PU	B99-001	Plutonium, Isotopic in Solids	PUPLATE	1			1	1	1	4
SR	B99-001	Total Strontium in Soil		1			1	1	1	4
U	B99-001	Uranium, Isotopic in Soil	UPLATE	1			1	1	1	4
TOTALS				6			6	6	6	24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/09/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0394

N904162-03

Method Blank

METHOD BLANK

SDG	7718	Client/Case no	Hanford SDG-H0394
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904162-03	Client sample id	Method Blank
Dept sample id	7718-003	Material/Matrix	SOLID
		SAF No	B99-001

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.027	0.027	0.10	0.30	U	U
Uranium 235	15117-96-1	0.016	0.033	0.12	0.30	U	U
Uranium 238	U-238	0	0.027	0.10	0.30	U	U
Plutonium 238	13981-16-3	0	0.008	0.016	0.050	U	PU
Plutonium 239/240	PU-239/240	0.010	0.008	0.012	0.050	U	PU
Nickel 63	13981-37-8	-0.973	1.1	2.0	20	U	NI_L
Total Strontium	SR-RAD	0.012	0.13	0.24	1.0	U	SR
Cobalt 60	10198-40-0	U		0.005	0.050	U	GAM
Cesium 134	13967-70-9	U		0.006		U	GAM
Cesium 137	10045-97-3	U		0.004	0.050	U	GAM
Europium 152	14683-23-9	U		0.012	0.10	U	GAM
Europium 154	15585-10-1	U		0.014	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM
Americium 241	14596-10-2	U		0.010		U	GAM
Uranium 238	U-238	U		0.58		U	GAM
Uranium 235	15117-96-1	U		0.016		U	GAM

100 BC Areas-Quick Turn

QC-BLANK 30662

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0394

N904162-06

Method Blank

METHOD BLANK

SDG 7718	Client/Case no Hanford	SDG-H0394	
Contact L.A. Johnson	Case no TRB-SBB-207925		
Lab sample id N904162-06	Client sample id Method Blank		
Dept sample id 7718-006	Material/Matrix	SOLID	
	SAF No B99-001		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	-0.004	0.005	0.015	0.050	U	AM

100 BC Areas-Quick Turn

QC-BLANK 30766

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

N904162-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7718
Contact L.A. Johnson

Client/Case no Hanford SDG-H0394
Case no TRB-SBB-207925

Lab sample id N904162-02
Dept sample id 7718-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-001

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	4.35	0.62	0.32	0.30		U	4.94	0.20	88	79-121	80-120
Uranium 235	3.70	0.58	0.10	0.30		U	4.04	0.16	92	77-123	80-120
Uranium 238	4.78	0.67	0.31	0.30		U	5.09	0.20	94	78-122	80-120
Plutonium 238	5.62	0.22	0.017	0.050		PU	5.95	0.24	94	89-111	80-120
Plutonium 239/240	6.13	0.23	0.010	0.050		PU	5.66	0.23	108	88-112	80-120
Nickel 63	181	4.2	2.1	20		NI_L	168	6.7	108	82-118	
Total Strontium	12.7	0.50	0.19	1.0		SR	12.6	0.50	101	83-117	
Cobalt 60	0.330	0.027	0.011	0.050		GAM	0.353	0.014	93	75-125	80-120
Cesium 137	0.360	0.024	0.018	0.050		GAM	0.381	0.015	94	76-124	80-120

100 BC Areas-Quick Turn

QC-LCS 30661

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 06/09/99

N904162-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7718
Contact L.A. Johnson

Client/Case no Hanford SDG-H0394
Case no TRB-SBB-207925

Lab sample id N904162-05
Dept sample id 7718-005

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-001

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Americium 241	4.69	0.30	0.017	0.050		AM	4.79	0.19	98	87-113	80-120

100 BC Areas-Quick Turn

QC-LCS 30765

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

N904162-04

B0V843

DUPLICATE

SDG 7718 | Client/Case no Hanford | SDG-H0394

Contact L.A. Johnson | Case no TRB-SBB-207925

DUPLICATE	ORIGINAL	
Lab sample id N904162-04	Lab sample id N904162-01	Client sample id B0V843
Dept sample id 7718-004	Dept sample id 7718-001	Location/Matrix 100 B/C 116-C-Z SOLID
	Received 04/30/99	Collected 04/27/99 13:00
% solids 89.8	% solids 89.8	Custody/SAF No B99-001-156 B99-001

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	0.511	0.25	0.19	0.30		U	0.442	0.21	0.20		14	103
Uranium 235	0.029	0.059	0.23	0.30	U	U	0.063	0.063	0.24	U	-	
Uranium 238	0.486	0.20	0.19	0.30		U	0.416	0.21	0.20		16	97
Plutonium 238	1.46	0.26	0.091	0.050		PU	1.58	0.28	0.13		8	39
Plutonium 239/240	20.0	1.1	0.11	0.050		PU	18.6	1.0	0.088		7	16
Nickel 63	2820	28	5.9	20		NI_L	2760	28	5.2		2	21
Total Strontium	10.2	1.8	2.0	1.0		SR	10.7	1.7	1.8		5	41
Potassium 40	10.0	1.6	1.3			GAM	11.5	0.94	0.76		14	41
Cobalt 60	53.0	0.64	0.28	0.050		GAM	52.1	0.40	0.13		2	32
Cesium 134	U		0.37		U	GAM	U		0.25	U	-	
Cesium 137	150	0.90	0.49	0.050		GAM	152	0.60	0.26		1	32
Europium 152	43.0	1.1	1.2	0.10		GAM	41.9	0.68	0.73		3	32
Europium 154	4.40	0.74	0.57	0.10		GAM	4.58	0.40	0.41		4	42
Europium 155	U		0.68	0.10	U	GAM	U		0.48	U	-	
Americium 241	3.70	0.60	0.79			GAM	2.90	0.38	0.52		24	46
Uranium 238	U		45		U	GAM	U		29	U	-	
Uranium 235	U		1.1		U	GAM	U		0.68	U	-	

100 BC Areas-Quick Turn

QC-DUP#1 30663

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

N904162-07

B0V843

DUPLICATE

SDG 7718 Client/Case no Hanford SDG-H0394

Contact L.A. Johnson Case no TRB-SBB-207925

DUPLICATE		ORIGINAL		
Lab sample id N904162-07	Lab sample id N904162-01	Client sample id B0V843		
Dept sample id 7718-007	Dept sample id 7718-001	Location/Matrix 100 B/C 116-C-Z	SOLID	
	Received 04/30/99	Collected 04/27/99 13:00		
	% solids 89.8	Custody/SAF No B99-001-156	B99-001	

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Americium 241	5.52	0.35	0.034	0.050		AM	5.98	0.45	0.044		8	18

100 BC Areas-Quick Turn

QC-DUP#1 30767

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 06/09/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0394

N904162-01 B0V843

DATA SHEET

SDG	7718	Client/Case no	Hanford SDG-H0394
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904162-01	Client sample id	B0V843
Dept sample id	7718-001	Location/Matrix	100 B/C 116-C-Z SOLID
Received	04/30/99	Collected	04/27/99 13:00
% solids	89.8	Custody/SAF No	B99-001-156 B99-001

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.442	0.21	0.20	0.30		U
Uranium 235	15117-96-1	0.063	0.063	0.24	0.30	U	U
Uranium 238	U-238	0.416	0.21	0.20	0.30		U
Plutonium 238	13981-16-3	1.58	0.28	0.13	0.050		PU
Plutonium 239/240	PU-239/240	18.6	1.0	0.088	0.050		PU
Nickel 63	13981-37-8	2760	28	5.2	20		NI_L
Americium 241	14596-10-2	5.98	0.45	0.044	0.050		AM
Total Strontium	SR-RAD	10.7	1.7	1.8	1.0		SR
Potassium 40	13966-00-2	11.5	0.94	0.76			GAM
Cobalt 60	10198-40-0	52.1	0.40	0.13	0.050		GAM
Cesium 134	13967-70-9	U		0.25		U	GAM
Cesium 137	10045-97-3	152	0.60	0.26	0.050		GAM
Europium 152	14683-23-9	41.9	0.68	0.73	0.10		GAM
Europium 154	15585-10-1	4.58	0.40	0.41	0.10		GAM
Europium 155	14391-16-3	U		0.48	0.10	U	GAM
Americium 241	14596-10-2	2.90	0.38	0.52			GAM
Uranium 238	U-238	U		29		U	GAM
Uranium 235	15117-96-1	U		0.68		U	GAM

100 BC Areas-Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 2851-074					
B0V843	N904162-01		A1	7718-001	5.98
BLK (QC ID=30766)	N904162-06			7718-006	U
LCS (QC ID=30765)	N904162-05			7718-005	ok
Duplicate (N904162-01)	N904162-07			7718-007	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074	2σ prep error 5.0 %			Reference Lab	Notebook #2851 pg. 074											
B0V843	N904162-01		A1	0.044	0.500			67		1012			35	05/25/99	06/01	SS-001
BLK (QC ID=30766)	N904162-06			0.015	1.00			85		1012				05/25/99	06/01	SS-004
LCS (QC ID=30765)	N904162-05			0.017	1.00			77		1012				05/25/99	06/01	SS-002
Duplicate (N904162-01) (QC ID=30767)	N904162-07			0.034	0.500			92		1012			35	05/25/99	06/01	SS-005
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.028 ± 0.028
YIELD 80 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2851-074						
B0V843	N904162-01			7718-001	1.58	18.6
BLK (QC ID=30662)	N904162-03			7718-003	U	U
LCS (QC ID=30661)	N904162-02			7718-002	ok	ok
Duplicate (N904162-01)	N904162-04			7718-004	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050
100 BC Areas-Quick Turn						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074	2σ prep error 5.0 %			Reference Lab	Notebook #2851 pg. 074											
B0V843	N904162-01			0.13	0.100			97		1056			13	05/07/99	05/10	SS-005
BLK (QC ID=30662)	N904162-03			0.016	1.00			88		1056				05/07/99	05/10	SS-007
LCS (QC ID=30661)	N904162-02			0.017	1.00			86		1056				05/07/99	05/10	SS-006
Duplicate (N904162-01) (QC ID=30663)	N904162-04			0.11	0.100			95		1056			13	05/07/99	05/10	SS-008
Nominal values and limits from method				0.050	1.00			20-105		10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.068 ± 0.12
YIELD 92 ± 11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

Test U Matrix SOLID
SDG 7718
Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 2851-074											
B0V843	N904162-01			7718-001	0.442	U	0.416	106	74	15	17
BLK (QC ID=30662)	N904162-03			7718-003	U	U	U				
LCS (QC ID=30661)	N904162-02			7718-002	ok	ok	ok				
Duplicate (N904162-01)	N904162-04			7718-004	ok	- U	ok	105	67	6	12
Nominal values and limits from method		RDLs (pCi/g)			0.30	0.30	0.30	100		4	
100 BC Areas-Quick Turn							Averages	106		11	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074 2σ prep error 5.0 % Reference Lab Notebook #2851 pg. 074																
B0V843	N904162-01			0.24	0.500			83		108			8	05/05/99	05/05	SS-005
BLK (QC ID=30662)	N904162-03			0.12	1.00			84		108				05/05/99	05/05	SS-007
LCS (QC ID=30661)	N904162-02			0.32	1.00			99		108				05/05/99	05/05	SS-006
Duplicate (N904162-01) (QC ID=30663)	N904162-04			0.23	0.500			91		108			8	05/05/99	05/05	SS-008
Nominal values and limits from method				0.30	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.23 ± 0.16
YIELD 89 ± 15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 2851-074					
B0V843	N904162-01			7718-001	10.7
BLK (QC ID=30662)	N904162-03			7718-003	U
LCS (QC ID=30661)	N904162-02			7718-002	ok
Duplicate (N904162-01)	N904162-04			7718-004	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074	2σ prep error 10.0 %			Reference Lab	Notebook #2851 pg. 074											
B0V843	N904162-01			1.8	0.100			95		163			8	05/05/99	05/05	GRB-230
BLK (QC ID=30662)	N904162-03			0.24	1.00			93		150				05/05/99	05/05	GRB-219
LCS (QC ID=30661)	N904162-02			0.19	1.00			98		163				05/05/99	05/05	GRB-229
Duplicate (N904162-01) (QC ID=30663)	N904162-04			2.0	0.100			94		163			8	05/05/99	05/05	GRB-231
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES RP-500 Strontium - Initial Separation, rev 0
RP-519 Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.1 ± 2.0
YIELD 95 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

Test GAM Matrix SOLID
SDG 7718
Contact L.A. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2851-074						
B0V843	N904162-01			7718-001	52.1	152
BLK (QC ID=30662)	N904162-03			7718-003	U	U
LCS (QC ID=30661)	N904162-02			7718-002	ok	ok
Duplicate (N904162-01)	N904162-04			7718-004	ok	ok
Nominal values and limits from method 100 BC Areas-Quick Turn				RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074 2σ prep error 15.0 % Reference Lab Notebook #2851 pg. 074																
B0V843	N904162-01			0.26	176					402			8	05/03/99	05/05	JR,04,00
BLK (QC ID=30662)	N904162-03			0.005	750					405				05/03/99	05/05	JR,04,00
LCS (QC ID=30661)	N904162-02			0.018	750					404				05/03/99	05/05	JR,01,00
Duplicate (N904162-01) (QC ID=30663)	N904162-04			0.49	176					404			8	05/03/99	05/05	JR,03,00
Nominal values and limits from method				0.050	1.00					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.19 ± 0.46
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0394

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 2851-074					
B0V843	N904162-01			7718-001	2760
BLK (QC ID=30662)	N904162-03			7718-003	U
LCS (QC ID=30661)	N904162-02			7718-002	ok
Duplicate (N904162-01)	N904162-04			7718-004	ok
Nominal values and limits from method				RDLs (pCi/g)	20
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2851-074	2σ prep error 10.0 %	Reference Lab	Notebook #2851 pg. 074													
B0V843	N904162-01			5.2	0.500			46	62				12	05/07/99	05/09	LSC-005
BLK (QC ID=30662)	N904162-03			2.0	0.500			92	100					05/07/99	05/09	LSC-005
LCS (QC ID=30661)	N904162-02			2.1	0.500			89	100					05/07/99	05/09	LSC-005
Duplicate (N904162-01) (QC ID=30663)	N904162-04			5.9	0.500			36	79				12	05/07/99	05/09	LSC-005
Nominal values and limits from method				20	0.500					10			180			

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.8 ± 4.1
YIELD 66 ± 58

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0394
REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

SDG 7718
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

SDG 7718
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0394

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.